

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2005/001263

A. CLASSIFICATION OF SUBJECT MATTER  
Int.Cl<sup>7</sup> C07D311/66, 311/72

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
Int.Cl<sup>7</sup> C07D311/66, 311/72

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
CAPLUS (STN), CAOLD (STN), REGISTRY (STN), CASREACT (STN)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2003-146981 A (Mitsubishi Gas Chemical Co., Inc.), 21 May, 2003 (21.05.03), (Column 5, line 12 to column 6, line 1; column 1, lines 19 to 27) (Family: none)	1-9
Y	WO 01/92249 A2 (CORTHERAPEUTICS, INC.), 06 December, 2001 (06.12.01), (Page 62, lines 31 to 39) & US 2004/044225 A1	1-9
Y	JP 60-92283 A (Nippon Oil Co., Ltd.), 23 May, 1985 (23.05.85), (Page 3, upper right column, line 39 to lower left column, line 3) (Family: none)	1-9

☒ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

## \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance  
"E" earlier application or patent but published on or after the international filing date  
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)  
"O" document referring to an oral disclosure, use, exhibition or other means  
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention  
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone  
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art  
"&" document member of the same patent family

Date of the actual completion of the international search  
16 February, 2005 (16.02.05)

Date of mailing of the international search report  
08 March, 2005 (08.03.05)

Name and mailing address of the ISA/  
Japanese Patent Office

Authorized officer

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INTERNATIONAL SEARCH REPORT

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CRAVOTTO, G., "The reactivity of 4-hydroxy coumarin under heterogeneous high-intensity sonochemical conditions", Synthesis, 2003, No.8, pages 1286 to 1291	1-9

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(With respect to scope for search)

The terms "phenol or an analogue thereof" and "an olefin or an analogue thereof" given in claims 1, 4, 7, 8, and 10 and the term "optionally substituted" given in claim 1 are unclear as to what structure the compound implies. As a result, the scope of the reaction product "chromancarboxylic ester" given in claims 4 and 10 is also unclear. Even when the statements in the description are taken into account, these terms are not considered to be clearly defined although examples are shown. Consequently, it cannot be immediately thought that the compounds other than the compounds specified in the description likewise generate the chroman compound of claim 1 or 4.

With respect to "formaldehyde or an analogue thereof" given in claims 1-10, there is the statement "formaldehyde or an analogue thereof examples of which include paraformaldehyde or trioxane" in column [0007] of the description. On the other hand, in column [0011] of the description, there is the statement "formaldehyde or an analogue thereof means formaldehyde, an aqueous formaldehyde solution or a formaldehyde solution, or paraformaldehyde, which is capable of generating formaldehyde." Consequently, it is unclear as to what structures of compounds the "formaldehyde or an analogue thereof" includes.

Since claim 9 is "a process for producing 6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylic acid," the starting compound is considered to be "1,4-dihydroxy-2,3,5-trimethylbenzene." This is inconsistent with the statement that the starting compound is "1,4-dihydroxy-2,6-dimethylbenzene."

Therefore, a search was made mainly for the part which is supported by and disclosed in the description.

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